

CLAIMS

THAT WHICH IS CLAIMED IS:

1. A method for selecting a frequency hopping mode for a communication in a communication system having a plurality of transmission schemes, the method
5 comprising:
 selecting one of a plurality of candidate frequency hopping modes as the frequency hopping mode for the communication based on a transmission scheme of the plurality of transmission schemes selected for the communication.
- 10 2. The method of Claim 1 wherein selecting one of the plurality of transmission schemes to be used for the communication comprises dynamically selecting one of the plurality of transmission schemes to be used for the communication based on at least one of a characteristic of the communication and a characteristic of a channel over which the communication is to be communicated.
- 15 3. The method of Claim 2 wherein each of the transmission schemes has at least one of an associated coding rate and modulation scheme.
- 20 4. The method of Claim 3 wherein the communication comprises a packet distributed over a plurality of transmission windows and wherein ones of the plurality of candidate frequency hopping modes define a transmission frequency for the packet in respective ones of the transmission windows.
- 25 5. The method of Claim 4 wherein selecting one of a plurality of candidate frequency hopping modes as the frequency hopping mode for the communication based on the determined transmission scheme for the communication further comprises selecting one of a plurality of candidate frequency hopping modes providing a common frequency as the transmission frequency for the packet in each of the plurality of transmission windows when the determined transmission scheme for the communication
30 has an associated coding rate that falls within a first region of a selection criterion and selecting one of the plurality of candidate frequency hopping modes providing at least two different frequencies for the packet when the determined transmission scheme for the communication has an associated coding rate that falls within a second region of the selection criterion.

6. The method of Claim 5 wherein the selection criterion defines at least three regions and wherein selecting one of a plurality of candidate frequency hopping modes as the frequency hopping mode for the communication based on the determined transmission scheme for the communication further comprises selecting a first one of a plurality of candidate frequency hopping modes providing a common frequency as the transmission frequency for the packet in each of the plurality of transmission windows when the determined transmission scheme for the communication has an associated coding rate that falls within a first region of the selection criterion, selecting a second one of the plurality of candidate frequency hopping modes providing at least two different frequencies for the packet when the determined transmission scheme for the communication has an associated coding rate that falls within a second region of the selection criterion and selecting a third one of the plurality of candidate frequency hopping modes providing a number of different frequencies for the packet which differs from the first one and the second one of the plurality of candidate frequency hopping modes when the determined transmission scheme for the communication has an associated coding rate that falls within a third region of the selection criterion.

7. The method of Claim 4 wherein ones of the plurality of candidate frequency hopping modes have different numbers of associated frequencies over which the packet is transmitted and wherein selecting one of a plurality of candidate frequency hopping modes as the frequency hopping mode for the communication based on the determined transmission scheme for the communication further comprises:

determining a desired number of associated frequencies over which the packet is to be distributed based on the determined transmission scheme and a signal quality of the channel; and

selecting one of the plurality of candidate frequency hopping modes having the desired number of associated frequencies.

8. The method of Claim 7 wherein selecting one of the plurality of candidate frequency hopping modes having the desired number of associated frequencies further comprises selecting one of the plurality of candidate frequency hopping modes with a highest number of associated frequencies which does not exceed an upper bound number of frequencies for the determined transmission scheme.

9. The method of Claim 8 further comprising selecting the number of transmission windows to equal the number of associated frequencies of the selected one of the plurality of candidate frequency hopping modes.

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10. The method of Claim 7 wherein the communication comprises a plurality of packets and further comprising applying packet by packet frequency hopping across ones of the plurality of packets.

10 11. The method of Claim 7 wherein the communication system comprises an Enhanced Data Rates for Global Evolution (EDGE) system and wherein the packet is distributed over multiple transmission windows.

12. A method for transmitting a communication packet in a communication system having a plurality of transmission schemes, the method comprising:
15 receiving the communication packet for transmission over the communication system;

assigning one of the plurality of transmission schemes to the communication packet, the assigned transmission scheme having an associated coding rate and
20 modulation scheme;

selecting one of a plurality of candidate frequency hopping modes as the frequency hopping mode for the communication packet based on the assigned transmission scheme, each of the plurality of candidate frequency hopping modes having an associated number of transmission frequencies for use in frequency hopping wherein
25 one of the candidate frequency hopping modes has one as the associated number to provide no frequency hopping;

associating portions of the communication packet with different transmission windows of a channel of the communication system; and

transmitting the portions of the communication packet in their respective
30 associated different transmission windows using frequency hopping across the associated number of transmission frequencies of the selected one of the plurality of candidate frequency hopping modes.

13. The method of Claim 12 wherein selecting one of a plurality of candidate frequency hopping modes as the frequency hopping mode for the communication packet further comprises selecting one of the plurality of candidate frequency hopping modes as the frequency hopping mode for the communication based on the assigned transmission
5 scheme and a characteristic of the channel.

14. The method of Claim 13 wherein selecting one of a plurality of candidate frequency hopping modes as the frequency hopping mode for the communication further comprises selecting the one of a plurality of candidate frequency hopping modes
10 providing no frequency hopping as the frequency hopping mode for the communication when the assigned transmission scheme for the communication has an associated coding rate that falls within a first region of a selection criterion and selecting one of the plurality of candidate frequency hopping modes providing at least two different transmission frequencies for use in frequency hopping for the packet when the
15 determined transmission scheme for the communication has an associated coding rate that falls within a second region of the selection criterion.

15. The method of Claim 13 wherein the characteristic of the channel comprises a signal quality of the channel.
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16. The method of Claim 15 wherein selecting one of a plurality of candidate frequency hopping modes as the frequency hopping mode for the communication further comprises selecting one of the plurality of candidate frequency hopping modes with a highest number of associated transmission frequencies which does not exceed an upper
25 bound number of frequencies for the assigned transmission scheme.

17. The method of Claim 16 wherein associating portions of the communication packet with different transmission windows of a channel of the communication system further comprises selecting the number of transmission windows
30 to equal the number of associated transmission frequencies of the selected one of the plurality of candidate frequency hopping modes.

18. The method of Claim 12 further comprising receiving additional communication packets and transmitting the communication packet and the additional

communication packets using packet by packet frequency hopping across ones of the communication packets.

19. The method of Claim 12 further comprising receiving the transmitted
5 portions at a receiver device to recreate the communication packet.

20. The method of Claim 12 wherein the communication system comprises an
Enhanced Data Rates for Global Evolution (EDGE) system and wherein the packet is
associated with multiple different transmission windows.

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21. A system for selecting a frequency hopping mode for a communication in
a communication system having a plurality of transmission schemes, the system
comprising:

a transmission scheme selection circuit that determines one of the plurality of
15 transmission schemes to be used for the communication; and

a frequency hopping mode selection circuit that selects one of a plurality of
candidate frequency hopping modes as the frequency hopping mode for the
communication based on the determined transmission scheme for the communication.

22. The system of Claim 21 wherein the system comprises a mobile terminal.

23. The system of Claim 21 wherein the system comprises a base station.

24. The system of Claim 21 wherein the frequency hopping mode selection
25 circuit is configured to dynamically select one of the plurality of transmission schemes to
be used for the communication based on at least one of a characteristic of the
communication and a characteristic of a channel over which the communication is to be
communicated.

25. The system of Claim 24 wherein each of the transmission schemes has at
30 least one of an associated coding rate and modulation scheme.

26. The system of Claim 25 wherein the communication comprises a packet
distributed over a plurality of transmission windows and wherein ones of the plurality of

candidate frequency hopping modes define a transmission frequency for the packet in respective ones of the transmission windows.

27. The system of Claim 26 wherein the frequency hopping mode selection circuit is configured to select one of a plurality of candidate frequency hopping modes providing a common frequency as the transmission frequency for the packet in each of the plurality of transmission windows when the determined transmission scheme for the communication has an associated coding rate that falls within a first region of a selection criterion and to select one of the plurality of candidate frequency hopping modes providing at least two different frequencies for the packet when the determined transmission scheme for the communication has an associated coding rate that falls within a second region of the selection criterion.

28. The system of Claim 27 wherein the selection criterion defines at least three regions and wherein the frequency hopping mode selection circuit is configured to select a first one of a plurality of candidate frequency hopping modes providing a common frequency as the transmission frequency for the packet in each of the plurality of transmission windows when the determined transmission scheme for the communication has an associated coding rate that falls within a first region of the selection criterion, to select a second one of the plurality of candidate frequency hopping modes providing at least two different frequencies for the packet when the determined transmission scheme for the communication has an associated coding rate that falls within a second region of the selection criterion and to select a third one of the plurality of candidate frequency hopping modes providing a number of different frequencies for the packet which differs from the first one and the second one of the plurality of candidate frequency hopping modes when the determined transmission scheme for the communication has an associated coding rate that falls within a third region of the selection criterion.

29. The system of Claim 26 wherein ones of the plurality of candidate frequency hopping modes have different numbers of associated frequencies over which the packet is transmitted and wherein the frequency hopping mode selection circuit further comprises:

means for determining a desired number of associated frequencies over which the packet is to be distributed based on the determined transmission scheme and a signal quality of the channel; and

- means for selecting one of the plurality of candidate frequency hopping modes
5 having the desired number of associated frequencies.

30. The system of Claim 29 wherein the frequency hopping mode selection circuit is further configured to select one of the plurality of candidate frequency hopping modes with a highest number of associated frequencies which does not exceed an upper
10 bound number of frequencies for the determined transmission scheme.

31. The system of Claim 30 further comprising a transmission window selection circuit that selects the number of transmission windows to equal the number of associated frequencies of the selected one of the plurality of candidate frequency hopping
15 modes.

32. The system of Claim 29 wherein the communication comprises a plurality of packets and further comprising a packet frequency hopping circuit that applies packet by packet frequency hopping across ones of the plurality of packets.
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33. The method of Claim 29 wherein the communication system comprises an Enhanced Data Rates for Global Evolution (EDGE) system and wherein the packet is distributed over multiple transmission windows.

25 34. A system for transmitting a communication packet in a communication system having a plurality of transmission schemes, the system comprising:

a transmission scheme selection circuit that assigns one of the plurality of transmission schemes to the communication packet, the assigned transmission scheme having an associated coding rate and modulation scheme;

30 a frequency hopping mode selection circuit that selects one of a plurality of candidate frequency hopping modes as the frequency hopping mode for the communication packet based on the assigned transmission scheme, each of the plurality of candidate frequency hopping modes having an associated number of transmission

frequencies for use in frequency hopping wherein one of the candidate frequency hopping modes has one as the associated number to provide no frequency hopping; a packet segmentation circuit that associates portions of the communication packet with different transmission windows of a channel of the communication system;

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a transmitter that transmits the portions of the communication packet in their respective different transmission windows using frequency hopping across the associated number of transmission frequencies of the selected one of the plurality of candidate frequency hopping modes.

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35. The system of Claim 34 wherein the system comprises a mobile terminal.

36. The system of Claim 34 wherein the system comprises a base station.

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37. The system of Claim 34 wherein the frequency hopping mode selection circuit is further configured to select one of the plurality of candidate frequency hopping modes as the frequency hopping mode for the communication based on the assigned transmission scheme and a characteristic of the channel.

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38. The system of Claim 37 wherein the frequency hopping mode selection circuit is further configured to select the one of a plurality of candidate frequency hopping modes providing no frequency hopping as the frequency hopping mode for the communication when the assigned transmission scheme for the communication has an associated coding rate that falls within a first region of a selection criterion and to select one of the plurality of candidate frequency hopping modes providing at least two different transmission frequencies for use in frequency hopping for the packet when the determined transmission scheme for the communication has an associated coding rate that falls within a second region of the selection criterion.

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39. The system of Claim 37 wherein the characteristic of the channel comprises a signal quality of the channel.

40. The system of Claim 39 wherein the frequency hopping mode selection circuit is further configured to select one of the plurality of candidate frequency hopping

modes with a highest number of associated transmission frequencies which does not exceed an upper bound number of frequencies for the assigned transmission scheme.

41. The system of Claim 40 wherein the packet segmentation circuit is further
5 configured to select the number of transmission windows to equal the number of
associated transmission frequencies of the selected one of the plurality of candidate
frequency hopping modes.

42. The system of Claim 34 further comprising means for receiving additional
10 communication packets and transmitting the communication packet and the additional
communication packets using packet by packet frequency hopping across ones of the
communication packets.

43. The system of Claim 34 wherein the communication system comprises an
15 Enhanced Data Rates for Global Evolution (EDGE) system and wherein the packet is
associated with multiple different transmission windows.

44. A system for selecting a frequency hopping mode for a communication in
a communication system having a plurality of transmission schemes, the system
20 comprising:

means for selecting one of a plurality of candidate frequency hopping modes as
the frequency hopping mode for the communication based on a transmission scheme of
the plurality of transmission schemes selected for the communication; and

means for determining the transmission scheme of the plurality of transmission
25 schemes selected for the communication.

45. A system for transmitting a communication packet in a communication
system having a plurality of transmission schemes, the system comprising:

means for receiving the communication packet for transmission over the
30 communication system;

means for assigning one of the plurality of transmission schemes to the
communication packet, the assigned transmission scheme having an associated coding
rate and modulation scheme;

means for selecting one of a plurality of candidate frequency hopping modes as the frequency hopping mode for the communication packet based on the assigned transmission scheme, each of the plurality of candidate frequency hopping modes having an associated number of transmission frequencies for use in frequency hopping wherein
5 one of the candidate frequency hopping modes has one as the associated number to provide no frequency hopping;

means for associating portions of the communication packet with different transmission windows of a channel of the communication system; and

means for transmitting the portions of the communication packet in their
10 respective associated different transmission windows using frequency hopping across the associated number of transmission frequencies of the selected one of the plurality of candidate frequency hopping modes.